

# Itho CVE ECO 2 RFT

Installer/User manual



Climate for life.

# Safety

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## Warning

- Do not use this appliance for functions other than those described in the booklet
- After removing the appliance from its packaging, ensure that it is complete and undamaged. In doubt contact Itho UK Ltd. Do not leave the packaging within reach of children or the infirm.
- Certain fundamental rules must be observed when using any electrical appliance, including a) never touch appliances with wet or damp hands; b) never touch appliances while barefoot; c) do not allow children to use the appliance without supervision; d) supervise infirm persons when using the appliance.
- Store the appliance out of the reach of children and infirm persons if you decide to disconnect it from

the power supply and no longer use it.

- Do not operate the appliance in the presence of inflammable substances or vapours (alcohols, insecticides, petrol, etc).

## Caution

The following general instructions are important:

- Follow the safety instructions to prevent fan damage and personal injuries.
- Maintenance instructions must be followed to prevent damage and/or excessive wear and tear.
- The specifications in this manual may not be modified.
- The fans may not be modified.
- The motor module is only suitable for a 230 V 50 Hz A.C. system.
- Do not expose the appliance to the weather (rain, sun, etc).

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- Do not place objects on top of the appliance.
  - Regularly inspect the appliance for visible defects.  
If any faults are found, contact Itho UK Ltd.  
immediately.
  - The appliance must only be installed by a professionally qualified person.
  - Ensure that the electrical system to which the appliance is connected complies with applicable standards.
  - Use a multi-polar switch with a minimum contact gap of 3 mm to install the appliance.
  - Switch of the appliance at the main switch: a) if the appliance does not function correctly; b) before cleaning the outside of the appliance; c) if the appliance is not to be used for any length of time.
  - Be careful to avoid damaging the electric circuit.
  - Do not use the appliance to control activation of water

heaters, room heaters etc., nor should it discharge into the flues of any such appliances.

- Ensure that the appliance discharges into a single duct (dedicated to this product) which is routed to the outside.
- The air to be extracted from the dwelling must be clean (i.e. free of grease, soot, chemical and corrosive agents, explosive or flammable mixtures).
- Keep the appliance intake and outlet valves/grilles free to ensure optimum airflow at all times.

### Electronic components

The CVE ECO 2 RFT fan contains parts which may be live. Consult a professionally qualified installer in the event of an alleged fault. All repairs and maintenance work should be carried out by a professionally qualified installer.

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## **Maintenance**

The ventilation unit should be inspected regularly for contamination. Electrically discharge the unit before carrying out any work on it. First isolate the unit from the mains supply and make sure that the unit is not re-connected to the supply socket by yourself or anyone else before you have completed the work.

### **Rotating parts**

The CVE ECO 2 RFT fan contains rotating mechanical parts. These parts will keep on turning for a few seconds after disconnecting the unit from the supply. For this reason wait at least 10 seconds after isolating the product before opening the unit. The fan will not be moving after these 10 seconds have elapsed.

### **Sharp edges of the ducts**

The valves in your home should also be cleaned regularly. These can be removed from the wall or ceiling. Beware of protruding duct sections. These can be very sharp.

### **Replacing the valves**

The valves should always be placed back in their original locations. Do not turn the valve during the cleaning process; make sure to mark the setting before cleaning the valve. If the valves are switched or set differently, the ventilation volumes will no longer be correct and the ventilation system will not work optimally. The bathroom may then remain humid for too long, your toilet may be very cool or your kitchen may smell mouldy.

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Subject to changes without notice.

No rights can be derived from this user manual.

# 1 Introduction

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Interior comfort and energy efficiency are becoming increasingly important considerations in building. More and more equipment is being developed to control the climate within the home while meeting the requirements for comfort and energy efficiency. One of these devices is the Itho UK Ltd CVE ECO 2 RFT, an extractor unit which is the heart of the whole house ventilation system.

A CVE ECO 2 RFT has been installed in your home. In this user manual you will find information about the necessity of good ventilation and how your CVE ECO 2 RFT works. Additionally, we explain how to operate and maintain the unit.

It is important that you read this user manual thoroughly before using the ventilation system in your home. It is also a good idea to keep the manual near your CVE ECO 2 RFT unit.

## **Compliance with Building Regulations**

The 2010 Edition of the U.K. Building Regulations Approved Document F1: Means of Ventilation (applicable in England and Wales) details 4 clearly defined systems of ventilation to dwellings. System 3 – Continuous mechanical extract (MEV) is complied with by the new CVE ECO 2 RFT ultra-high efficiency whole house extract ventilation system.

System 3 – Continuous mechanical extract requires a “minimum high rate” in each wet room to be achieved (Kitchens 13 l/s and both utilities and bathrooms 8 l/s - sanitary only 6 l/s).

The “minimum low rate” is calculated by taking the number of bedrooms in the dwelling and applying the l/s value from Table 1.1b. In addition the rate should be no less than 0.3 l/s per m<sup>2</sup> of internal floor area (all storey's)

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plus for each additional occupant over and above the anticipated two for the first bedroom and one for each of the others a further 4 l/s must be added to the extract rate. The system provides quiet, uninterrupted extract ventilation from the dwelling, removing warm stale air via all of the “wet” rooms, creating a permanent air path through the property from the “dry” habitable rooms.

Air is usually drawn into the property through background ventilators located in the building facades. However if the system is being installed to solve an incoming airborne noise issue, background ventilators may be omitted (subject to the proven air tightness of the dwelling). There is a boost facility on the fan which enables the extract rates from all wet rooms to be increased to counter increased pollutants caused by cooking or bathing activities.

The current Building (Scotland) Regulations refers to continuously operating mechanical extract ventilation in accordance with the guidance in BRE (Building Research Establishment) Digest 398, a paper based on the former government department’s (and now private company) own tests and recommendations , specifically 0.5 air changes per hour throughout the property. The CVE ECO 2 RFT complies fully with the recommendations contained within this document.

With the Governments actively encouraging energy saving and a target for all new homes to be ‘carbon zero’ by 2016, the CVE ECO 2 RFT has been designed ‘future proof’. The ‘Code for Sustainable Homes’ was updated in October 2010 to reflect the changes to the 2010 Building Regulations. Level 4 now requires a further 25% reduction in CO<sub>2</sub> emissions.

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To achieve the three highest levels of reduction of carbon emissions, the air leakage of the dwelling must be improved so significantly that continuous ventilation becomes the only appropriate method. In addition, it must be demonstrated that the ventilation system itself must be energy efficient. The CVE ECO 2 RFT with its low energy D.C. motor and innovative impeller, has been independently tested by the Building Research Establishment (BRE) to the appropriate SAP<sup>1)</sup> Appendix Q test methodology and is therefore Appendix Q eligible

<sup>1)</sup> The Governments Standard Assessment Procedure (SAP) is a method assessing the energy performance of dwellings and SAP Appendix Q provides an allowance for the benefits of energy-saving appliances; products may be independently assessed and the results uploaded to the SAP website.



## 2 Why is ventilation important?

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### Ventilation is necessary

In the past people built houses which were not air-tight, which leaked air, for example, at the connection point of the wall and the floor or roof. Cracks were always visible around windows and doors. All these openings ensured that large volumes of air moved in and out of the buildings. When the wind was blowing the complete air content of the home was refreshed three to four times an hour. This ensured very good ventilation of the home, but a lot of energy was lost.

Construction methods have changed. Floors, walls and roofs are, when possible, constructed with a layer of insulation. The insulation ensures that there are nearly no cracks and the airtightness is increased. It is a misconception to think that there is still enough ventilation in a home without some type of ventilation system.

Ventilation is absolutely necessary in an air-tight home to prevent problems related to humidity, mould and the health of the residents.

### Moisture content of the home

Incorrect use of the ventilation system by the resident in combination with today's well-insulated homes gives humidity an open field. The moisture content in the homes increases and can cause health, humidity and mould problems. A family of four persons produces 14 to 20 litres of moisture per day just by breathing, sleeping, cooking, washing, dishwashing, bathing, watering plants, etc. Many products, such as textile, carpets, parquet, newspapers and cigarettes, contain substances that harm the health of the residents. All the moisture such as water vapour and aromatic substances should be removed from the homes.

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### **The correct use of the ventilation system is important**

Ventilation requires energy. The correct use of the ventilation system can limit energy loss as much as possible.

Your home has an Itho system which was supplied by Itho UK Ltd. This system can contribute extensively to a healthy interior climate and an optimum comfort level. Another advantage is that the electricity costs are lower than other ventilation systems. The ventilation system can, however, only function correctly when used and maintained in a responsible manner. Some data: 5 to 20% of people have an airway disorder. The number of house dust mite has increased a hundredfold in the past 25 years. The number of people suffering from Chronic Non-Specific Lung Disease has doubled in the last 15 years.

Research has proven that fighting moisture in homes greatly contributes to the decrease of allergic reactions of people with an airway disorder. The correct use and maintenance of your ventilation system makes this possible!

An individual ventilation system has been built into your home. This self-contained system allows you to adjust your individual ventilation system. The system consists of the following parts:

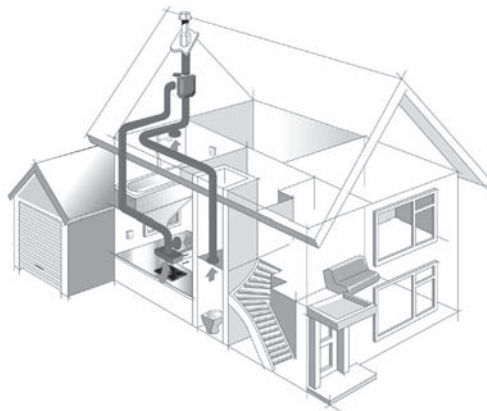
- CVE ECO 2 RFT extractor unit
- Valves
- Switch to select low or high rate ventilation (CVE ECO 2 RFT) or,
- One or more RFT switches with three speed settings (CVE ECO 2 RFT)

### 3 Individual ventilation system

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#### How the individual ventilation system works

The extractor unit ventilates several rooms in the home through ducts fitted in the kitchen, the bathroom, the WC and all other 'wet rooms'. These are connected to the central extractor fan system. To ensure there is a good distribution of air, valves are fitted to the openings of the ventilation ducts in the rooms to be ventilated. Air is extracted from the rooms through these valves, while fresh air from outside enters the home through openings, such as grilles, in the walls and windows of living rooms and bedrooms.





## 4 The CVE ECO 2 RFT central-ventilation unit

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The CVE ECO 2 RFT was developed to maintain a comfortable climate within home by means of an energy-efficient and convenient technology.

The energy efficiency comes from the application of direct current motors. The CVE ECO 2 RFT has the added convenience of radio frequency (RFT) remote control.

### **Energy-efficient direct current motor**

The energy efficiency demands of homes and building practises are becoming increasingly stringent. For this reason, the Itho CVE ECO 2 RFT is equipped with direct current motors. These make the unit very energy efficient and deliver significant savings on electricity costs (up to 80%).

### **Innovative technology**

A number of innovative technologies have been used in the development of the CVE ECO 2 RFT. For example, the unit has a single printed circuit board for both the regulating and the control electronics. The construction of the fan is also new. The air is now circulated through the fan by cone-shaped blades. This results in more efficient propulsion of the air and thus to greater energy efficiency.

## 5 The components of the CVE ECO 2 RFT

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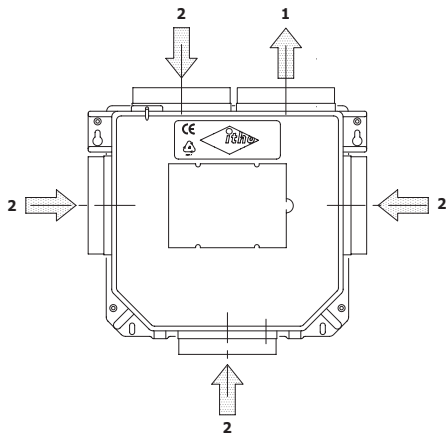
The CVE ECO 2 RFT is modular and has several different components. This makes the system more reliable technically and simpler to service. The unit is made of polypropylene (a type of plastic). This material has a long life and can be cleaned with a damp cloth.

### Housing

The housing of the CVE ECO 2 RFT is constructed to allow easy replacement of the parts, which makes maintenance and cleaning very simple. The unit can be mounted on the wall or ceiling using the mounting brackets provided.

The unit has five air connections. The right port on the unit (1) is the outlet funnel for air extracted and blown outside. The other four ports (2) are for the removal of the air from the home. They are located as follows:

- On the top left of the unit.
- On the right side of the unit.
- On the left side of the unit.
- On the bottom of the unit.



The blue covers on the unit close off the unused air inlets to prevent leakage of air and ensure that maximum capacity is used.

### Front cover

To permit installation of the RFT set receiver or other work, such as maintenance, the unit's front cover can be removed with a screwdriver. Insert the screwdriver horizontally in the space provided on the top left and press open the cover. You can then remove the cover by hand.

**Note: Disconnect the unit from the mains supply before removing the front cover.**



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### Service module

If there is a fault with the motor or electronics, the technician can easily fix the unit by replacing the service module.

The warranty on the service module is for two years from the installation date. For more information about the terms and conditions of the warranty, see chapter 7.

### Motor-driven fan

The motor-driven fan forms the heart of the ventilation unit and has been specially designed for CVE ECO 2 RFT. During the development of the direct current motor, special attention was paid to low noise levels, high efficiency and a high volume of air moved. This contributes to a healthy and comfortable interior climate in your home and lower operating costs.

### Electronics

The electronics are also an important part of the unit. When you change settings with the switch, the electronics carry out your command. The motor is set to the desired number of rpms to ensure sufficient ventilation. The electronics consist of a basic printed circuit board with an integrated RFT receiver which will permit the RFT remote control switches to operate the switches.

**The user should not touch any electronic parts  
– they may be electrically live.**



## 6 How to operate the unit

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Individual CVE ECO 2 RFT ventilation systems can be controlled either by a three speed hard wired switch or by wireless three speed RFT.

### Radio frequency (RF) operation switch

The RFT (radio frequency) operation switch (transmitter) can be used as a 3-position mode switch with timer feature for the CVE ECO 2 RFT ventilation unit. This operation switch can be used to set the ventilation unit to one of the three ventilation modes (capacities):

The modes are:

- Mode 1 - Low mode.
- Mode 2 - Medium mode.
- Mode 3 - High mode.

The low mode is used at night, the medium mode during the day when there are people at home and the high mode when cooking, showering or bathing.

The switch also has a timer. The ventilation unit can be switched to high mode for a predetermined time by pressing the timer button. The timer automatically switches the ventilation unit to low mode after the time has elapsed.

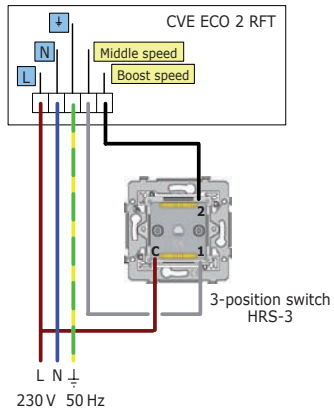
The length of time set for the timer is determined by the user. Press the timer button once to set the ventilation unit to high mode for 10 minutes. Press the timer button twice to set the ventilation unit to high mode for 20 minutes. Press the timer button three times to set the ventilation unit to high mode for 30 minutes.

If the operation switch is used by choosing mode 1, 2 or 3 while the timer is in operation, the timer is switched off and the ventilation unit operates in the chosen mode.

### Hard wired 3 position switch



The CVE ECO 2 RFT can be operated using the 3 position switch HRS-3. Step one is used at night, step two during the day when there are people at home and step three when cooking, showering or bathing.



# 7 Maintenance and warranty

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## Maintenance

Technical maintenance of the CVE ECO 2 RFT is not necessary. However, the unit will need to be cleaned once every three to four years depending on the accumulation of dust. You can check yourself whether the extractor unit is very dirty, but it must be cleaned by a qualified technician.

To check whether your extractor unit is dirty, follow these steps:

- Isolate the unit from the mains power supply.
- Remove one or more of the blue sealing covers so that you can see the fan.
- Inspect the fan for dust and dirt.

A little dust makes hardly any difference to the fan's performance. If the layer of dust and dirt is more than 1 mm thick on the inside of the blades, we advise having the fan cleaned.

- Check the bearings. You can do this by spinning the fan.

- Check that the bearings don't make any noise.
- Check that the fan doesn't swing from side to side.
- If the fan is set in motion by hand, it should only rotate a few times and then come to a standstill with a few jolts.
- This is a characteristic of a directcurrent fan and is completely normal.
- Depending on the outcome of the inspection, the fan should be cleaned and/or made ready for use.
- Fit the blue sealing covers to close the inlets.
- Re energise the mains supply.

## Valves

The valves have to be cleaned regularly to ensure the constant and reliable operation of the ventilation system and for your own health. Make sure that the setting of the system (air flow) is not changed when you clean the valves. The valve could be turned by accident and this

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would mean that the opening becomes larger or smaller. Each valve should be placed back in the same duct opening in the same room from which it was removed.

### **Cleaning valves**

Valves without a filter can be removed from the duct opening. The foam ring (if applicable) should be removed before cleaning the valve in warm water (and washing-up liquid). Replace the valve in the duct opening after cleaning. The valve should always be placed in the same duct opening it was removed from.

### **Maintenance of Ducting**

It is our recommendation that the ducting connected to the Extract Terminals (located in Kitchens, Utilities, Bathrooms and En-suites) needs to be inspected every 3 years and cleaned every 6 years. Cleaning of the grille and ducting can be carried out with a damp cloth.



## 8 Information for the installer

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### Installation

- The CVE ECO 2 RFT can be used in various types of homes, both in new building as well as renovation projects. The unit can be installed at different places in the home, for example, in a loft space, store room or cupboard.
- The extractor unit can be installed in all positions using the mounting eyes provided against a wall, on the ceiling and also on sloping surface.
- The CVE ECO 2 RFT should be installed following the general and local safety and installation regulations and the instructions in this manual:
  - The CVE ECO 2 RFT requires 230 V 50 Hz mains voltage. The tolerance for the mains voltage is 5%.
  - A multipolar switch must be fitted with a minimum contact gap of 3 mm.
  - The feeder cable is 1.5 m long and the connection is located towards the top of the unit.
  - The ducts should be of the correct dimensions (125 mm diameter or 204 X 60 rigid).
  - Fans and ducting in or passing through unheated voids or loft spaces should be insulated to reduce the possibility of condensation forming.

The unit can be connected in various ways.



The CVE ECO 2 RFT unit is controlled using the radio frequency module. For information about installing and operating the RFT option, please refer to the handbook provided with the RFT remote control set.

### Setting the basic printed circuit board

#### Potentiometer settings

The basic printed circuit board has two potentiometers to adjust the ventilation unit. The potentiometers can be adjusted to set the minimum and/or maximum capacity.

Potentiometer 1 adjusts the low setting for the unit. This potentiometer is limited on the lower side, so there can never be too little ventilation. The factory setting is 75 m<sup>3</sup>/h. This potentiometer should be adjusted to achieve the minimum rate as defined in ADF. If the minimum rate cannot be achieved at low speed then the medium speed should be set to the ADF minimum rate instead. The medium speed is calculated automatically by the unit, it is defined by a difference in the low and high speeds. Potentiometer 2 adjusts the high speed setting.

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This potentiometer has a factory setting of 225 m<sup>3</sup>/h. The high speed should be adjusted to the high rate as defined in ADF. The available range is 175 m<sup>3</sup>/h to 325 m<sup>3</sup>/h (at 150 Pa).

When setting up the system if more ventilation is needed, open the valves more fully to obtain the required capacity before adjusting the speed. Increasing the rpms of the motor leads to increased energy consumption and higher noise levels.

### **Removal of the front cover**

The front cover can be removed using a screwdriver. The clasp is on the (left) top side of the cover and the extractor case. The cover can be “pressed open” by horizontally inserting a screwdriver into the clasp. The cover can then be pulled out by hand.

### **Removal of motor chassis with motor/fan assembly**

There are three slots on the motor chassis. The clamps in the slots are released by inserting a (flat-blade) screwdriver into the motor chassis and pulling the screwdriver handle towards the motor chassis. After the clamps in all three slots have been opened in this way, a lifting strip (at the top right of the chassis) can be used to remove the entire motor chassis, including the motor and fan.

## 9 Manufacturer's statement

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### **EC declaration of conformity**

According to Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC

### **Declaration of Incorporation**

According to Annex IIB of the Machinery Directive 2006/42/EC,

Itho Images BV  
Soevereinstraat 8  
4879 NN Etten-Leur  
The Netherlands

hereby declare under our sole responsibility that the following products:

### **Mechanical extract unit**

#### **Type: CVE ECO 2 RFT**

is in conformity with the following EC Council Directives:

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC

and Applied Harmonised Standards:

- EN60730-1
- EN61000-3-2
- EN61000-6-1
- EN61000-6-3
- RoHs / Weee

and must be regarded as partly completed machinery and is intended to be incorporated in a machine or to be



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assembled with other machines into a single machine or system to which the Machinery Directive 2006/42/EC applies.

We want to alert you that the product is designed to be incorporated in a ventilation system and that the partly completed machine must not be put into service until the final machinery into which it is to be incorporated is in conformity with the provisions of Machinery Directive 2006/42/EC for which the most important instructions can be found in the manual.

We explicitly state that the CE marking on the product only refers to the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC

After the submission of a declaration according to Annex IIA of the Machinery Directive for the entire installation, the CE marking on the device also refers to the Machinery Directive 2006/42/EC.

A handwritten signature in black ink, appearing to read 'J. Braspenning', with a long, sweeping horizontal line extending to the right.

Etten-Leur, July 2011  
J. Braspenning  
Director

## 10 EC Declaration of Conformity

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According to Annex II of the Machinery Directive 2006/42/EC.

We: \_\_\_\_\_

Name of installer: \_\_\_\_\_

Full address and country: \_\_\_\_\_

Hereby declare under our own responsibility, to have installed the following product with type designation:

**Mechanical extract unit**

**Type: CVE ECO 2 RFT**

to which this declaration refers. We declare the entire installation (being a single machine) in conformity with the Machinery Directive.

Place: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Company Stamp:

Name: \_\_\_\_\_

Position: \_\_\_\_\_

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# Climate for life

Itho strives at all times to offer people an enjoyable living and working environment with its innovative solutions in climate systems. These are solutions for temperature, clean air and hot water in the domestic environment in which people and environment go

harmoniously together. We want a more comfortable and healthier living environment but at the same time, we aim for lower energy consumption. With sustainable technologies and innovations, Itho proves that seemingly opposite objectives can be combined

with very little effort. You can recognise these solutions by the Itho Living Blue label. Our aim is to develop climate systems that respect the world around us. Your wishes become our inspiration and Itho works constantly to achieve this: Climate for life.

## **Itho UK Ltd**

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Climate for life.